

WHAT IS CLAIMED IS:

1. An entertainment apparatus using cards for obtaining inputs from a plurality of cards on each of which a visually human-identifiable design is printed and performing information processing in accordance with the inputs, comprising:

5 a photographing means for photographing said design of said card and fetching a photographic pixel data array;

 a database including a plurality of entries individually corresponding to said plurality of cards, each of the entries including a pair of a card ID and a comparison data array;

10 a card identification means for searching said database for a specific comparison data array based on said photographic pixel data array and obtaining a card ID pairing up with the specific comparison data array; and

 an information processing means for performing said information processing with said card ID obtained by said card identification means as an input.

15 2. An entertainment apparatus as set forth in claim 1, wherein said photographing means includes an image sensor for photographing said design and outputting a photographic signal, a data array forming means for sampling said photographic signal at a first resolution and forming a data array, and a photographic pixel data array forming means for re-sampling said data array at a second resolution which is lower than said first resolution and forming said photographic pixel data array, and

20 said comparison data array includes comparison data corresponding to said second resolution.

 3. An entertainment apparatus as set forth in claim 2, wherein said card identification means calculates a distance between said photographic pixel data array and
25 said comparison data array, and obtains the card ID of the entry with the comparison data

array at the shortest distance.

4. An entertainment apparatus as set forth in claim 3, wherein said distance is a sum total of absolute values of differentials between respective elements of said photographic pixel data array and corresponding elements of said comparison data array.

5 5. An entertainment apparatus as set forth in claim 3, wherein said distance is a sum total of squares of differentials between the respective elements of said photographic pixel data array and the corresponding elements of said comparison data array.

6. An entertainment apparatus as set forth in any one of claims 2 to 5, wherein said photographic pixel data array forming means forms said photographic pixel data array with assignment of a predetermined weight to each element of said data array.

10 7. An entertainment apparatus as set forth in any one of claims 2 to 6, wherein said card identification means includes a threshold value determination means for determining whether or not said sum total of differentials is larger than a predetermined threshold value; and excludes any entry with said sum total of differentials larger than said
15 predetermined threshold value from identification candidates.

8. An entertainment apparatus as set forth in claim 7, wherein said card identification means includes a number-of-candidates determination means for determining a total number of candidates which are left as a result of determination by said threshold value determination means, and does not obtain any card ID when it is
20 determined by said number-of-candidates determination means that the number of candidates is "0", and obtains the card ID of the identification candidate when it is determined that the number of candidates is "1".

9. An entertainment apparatus as set forth in claim 8, taking said database as a first database, and further comprising a second database including one or more entries, each
25 of the entries including a plurality of candidate card IDs and one determination card ID,

wherein

said card identification means includes a number-of-candidates determination means for determining whether two or more said identification candidates are left or not, searches said second database for an entry in which there is a match between a
5 combination of card IDs of the left candidates and a combination of said candidate card IDs in said second database when it is determined by said number-of-candidates determination means that the number of candidates is “two or more” and, if there exists any matching entry, obtains the determination card ID of the entry.

10 10. An entertainment apparatus as set forth in any one of claims 1 to 9, wherein said database includes card data corresponding to each entry, and

said information processing means includes a card data display means for displaying at least the design based on the card data of the entry corresponding to said card ID obtained by said card identification means.

15 11. An entertainment apparatus as set forth in any one of claims 1 to 10, further comprising a cartridge connector, wherein said cartridge connector is equipped with a memory cartridge and the memory cartridge stores another database.

12. An entertainment apparatus using cards, which obtains inputs from a plurality of cards on each of which a visually human-identifiable design is printed and performs information processing according to the inputs, comprising:

20 a photographing means for photographing said design of said card and fetching a photographic pixel data array;

a card identification means for obtaining a data string corresponding to the design from said photographic pixel data array; and

25 an information processing means for performing said information processing with said data string obtained by said card identification means as an input.

13. An entertainment apparatus as set forth in any one of claims 1 to 12, further comprising:

a card photographing part for setting said card in a predetermined position; and

5 a light source for irradiating light to a surface to be photographed of the card set in said card photographing part.

14. An entertainment apparatus as set forth in claim 13, further comprising a reflection means for diffusely reflecting light from said light source and letting the light enter said surface to be photographed.

15. An entertainment apparatus as set forth in claim 13 or 14, further comprising:

10 a photographing part cover for covering said card photographing part, the cover having a position correction mark on a surface opposite to said photographing means; and

a photographic pixel data fetching area correction means for correcting a fetching area of photographic pixel data based on said position correction mark, wherein

15 said photographing means photographs said position correction mark under a state where no card is set in said card photographing part.

16. A method of identifying a card by photographing a plurality of cards on each of which a visually human-identifiable design is printed, including steps of:

(a) preparing a database including a plurality of entries individually corresponding to said plurality of cards, each of the entries including a pair of a card ID and a
20 comparison data array;

(b) photographing said design by an image sensor and obtaining a photographic signal;

(c) sampling said photographic signal at a first resolution and forming a data array;

25 (d) re-sampling said data array at a second resolution which is lower than said first resolution and forming photographic pixel data array; and

(e) searching said database for a specific comparison data array based on said photographic pixel data array and obtaining the card ID pairing up with the specific comparison data array.

5 17. A card identifying method as set forth in claim 16, wherein, in the step (e), a distance between said photographic pixel data array and said comparison data array is calculated, and the card ID of the entry with the comparison data array at the shortest distance is obtained.